HP ProLiant DL145 Server Maintenance and Service Guide

March 2004 (First Edition)
Part Number 361543-001

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About This Guide

This maintenance and service guide can be used for reference when servicing HP ProLiant DL145 servers.

WARNING: To reduce the risk of personal injury from electric shock and hazardous energy levels, only authorized service technicians should attempt to repair this equipment. Improper repairs can create conditions that are hazardous.

Audience Assumptions

This guide is for service technicians. HP assumes you are qualified in the servicing of computer equipment and trained in recognizing hazard in products with hazardous energy levels and are familiar with weight and stability precautions for rack installations.

Technician Notes

WARNING: Only authorized technicians trained by HP should attempt to repair this equipment. All troubleshooting and repair procedures are detailed to allow only subassembly/module-level repair. Because of the complexity of the individual boards and subassemblies, no one should attempt to make repairs at the component level or to make modifications to any printed wiring board. Improper repairs can create a safety hazard.

WARNING: To reduce the risk of personal injury from electric shock and hazardous energy levels, do not exceed the level of repairs specified in these procedures. Because of the complexity of the individual boards and subassemblies, do not attempt to make repairs at the component level or to make modifications to any printed wiring board. Improper repairs can create conditions that are hazardous.

WARNING: To reduce the risk of electric shock or damage to the equipment:

- **Disconnect power from the system by unplugging all power cords from the power supplies.**
- **Do not disable the power cord grounding plug. The grounding plug is an important safety feature.**
- **Plug the power cord into a grounded (earthed) electrical outlet that is easily accessible at all times.**

CAUTION: To properly ventilate the system, you must provide at least 7.6 cm (3.0 in.) of clearance at the front and back of the server.

CAUTION: The computer is designed to be electrically grounded (earthed). To ensure proper operation, plug the AC power cord into a properly grounded AC outlet only.

NOTE: Any indications of component replacement or printed wiring board modifications may void any warranty.

Where to Go for Additional Help

In addition to this guide, the following information sources are available:

- User documentation
- *Service Quick Reference Guide*
- Service training guides
- Service advisories and bulletins
- QuickFind information services

Telephone Numbers

For the name of the nearest HP authorized reseller:

- In the United States, call 1-800-345-1518.
- In Canada, call 1-800-263-5868.

For HP technical support:

- In the United States and Canada, call 1-800-633-3600.
- Outside the United States and Canada, refer to

  www.hp.com

1

Illustrated Parts Catalog

Mechanical Components Exploded View

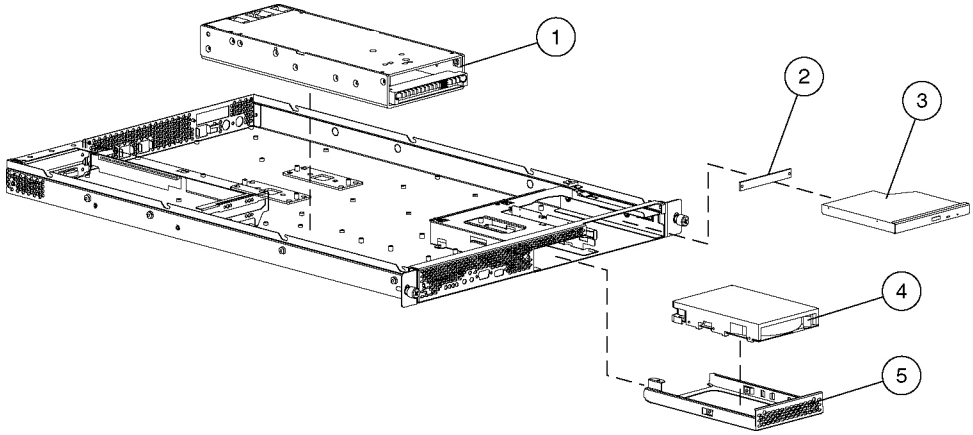

Figure 1-1: Mechanical components exploded view

Mechanical Components Spare Parts List

Table 1-1: Mechanical Components Spare Parts List

Item	Description	Spare Part Number
1	Power supply	361620-001
2	DVD adapter board	364313-001
3	DVD drive (optional)	361622-001
4	40-GB ATA 7200 NHP hard drive	232008-001
5	Drive tray	361640-001

System Components Exploded View

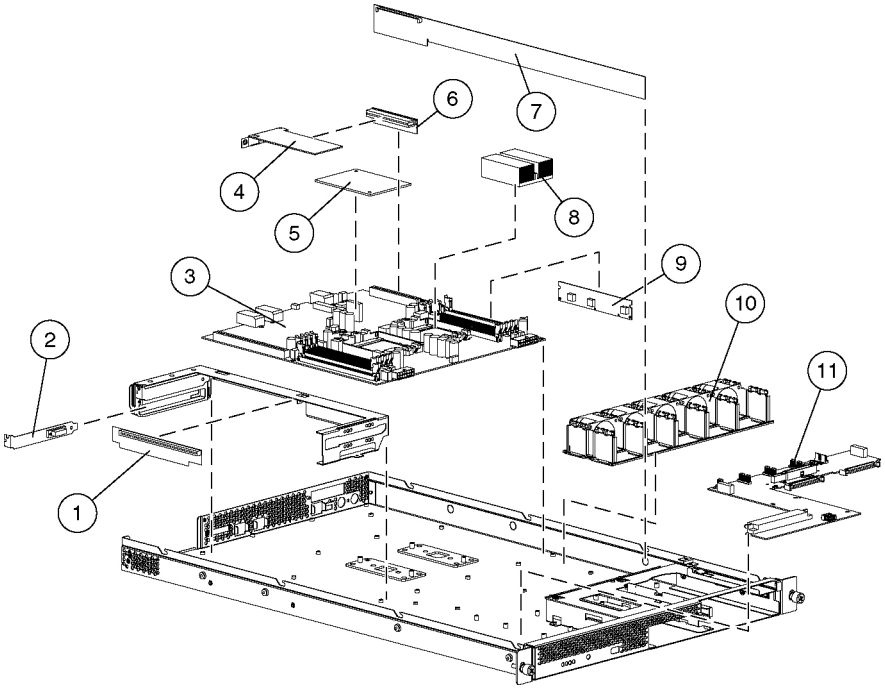

Figure 1-2: System components exploded view

System Components Spare Parts List

Table 1-2: System Components Spare Parts List

Item	Description	Spare Part Number
1	PCI-X 133 riser board	361618-001
2	COM1/IPMI cable	364317-001
3	System board	361614-001
4	VGA video board	364314-001
5	IPMI Base Management Controller	361615-001
6	32 bit PCI riser board	361619-001
7	Signal interface board	361617-001
8	Processor	
8a	Processor, 1.6 GHz	361956-001
8b	Processor, 1.8 GHz	361957-002
8c	Processor, 2.2 GHz	361958-003
8d	Reserved	
8e	Reserved	
8f	Reserved	
8g	Heatsink	361623-001
9	Processor power module	361632-001
10	Fan assembly	361621-001
11	Front panel board	361616-001
12	System battery, CR2032 3V LITHIUM*	234556-001
13	Memory*	
13a	512-MB, PC2700 (ECC DDR SDRAM)*	361959-001
13b	1-GB, PC2700 (ECC DDR SDRAM)*	361960-001
13c	2-GB, PC2700 (ECC DDR SDRAM)*	361961-001
14	AC power cord, 15 A, 125 V*	361628-001
15	16 Pin power cable*	361624-001
16	14 Pin power cable*	361625-001
17	IDE cable*	361626-001
18	Dual IDE cable*	364316-001
19	Drive power cable*	361627-001
* Not shown		

2

Removal and Replacement Procedures

You need the following items for some procedures:

- Phillips screwdriver

Safety Considerations

Before performing service procedures, review the following safety information.

Electrostatic Discharge

A discharge of static electricity can damage static-sensitive devices or micro-circuitry. Proper packaging and grounding techniques are necessary precautions to prevent damage. To prevent electrostatic damage:

- Transport products in static-safe containers such as conductive tubes, bags, or boxes.
- Keep electrostatic-sensitive parts in their containers until they arrive at static-free stations.
- Cover workstations with approved static-dissipating material. Use a wrist strap connected to the work surface and properly grounded (earthed) tools and equipment.
- Keep work area free of nonconductive materials such as ordinary plastic assembly aids and foam packing.
- Be sure that you are properly grounded (earthed) when touching a static-sensitive component or assembly.
- Avoid touching pins, leads, or circuitry.
- Use nonconductive field service tools.

Server Warnings and Cautions

WARNING: Do not exceed the level of repair specified in the procedures in the product documentation. All troubleshooting and repair procedures are detailed to allow only subassembly or module-level repair. Because of the complexity of the individual boards and subassemblies, do not attempt to make repairs at the component level or to make modifications to any printed wiring board. Improper repairs can create a safety hazard.

WARNING: To reduce the risk of electric shock or damage to the equipment:

- **Do not disable the AC power cord grounding plug. The grounding plug is an important safety feature.**
- **Plug the power cord into a grounded (earthed) electrical outlet that is easily accessible at all times.**
- **Unplug the power cord from each power supply to disconnect power to the equipment.**

WARNING: To reduce the risk of personal injury from hot surfaces, allow the hot-plug drives and the internal system components to cool before touching.

CAUTION: Do not operate the server for extended periods without the access panel. Operating the server without the access panel results in improper airflow and improper cooling that can lead to thermal damage.

Preparation Procedures

To access some components and perform certain service procedures, you must do one or more of the following:

- Extend the server from the rack.

  If you are performing service procedures in an HP, or third-party rack cabinet, you can use the locking feature of the rack rails to support the server and gain access to internal components.

  For more information about telco rack solutions, refer to the RackSolutions.com website:

  www.racksolutions.com/hp

- Access internal components.

  If you need to access internal components for removal or replacement, you can remove the access panel without removing the server from the rack.

- Power down the server.
- Remove the server from the rack.

  If the rack environment, cabling configuration, or the server location in the rack creates awkward conditions, remove the server from the rack.

Powering Up the Server

To power up the server, press the Power button.

Powering Down the Server

WARNING: To reduce the risk of personal injury, electric shock, or damage to the equipment, remove the power cord to remove power from the server. The front panel Power button does not completely shut off system power. Portions of the power supply and some internal circuitry remain active until AC power is removed.

1. Back up the server data.
2. Shut down the operating system as directed by the operating system documentation.
3. Press the Power button to power down the server. When the server powers down, the system power LED turns off.
4. Disconnect the power cord.

The system is now without power.

Extending the Server from the Rack

Extend the server on the rack rails until the server rail-release latches engage.

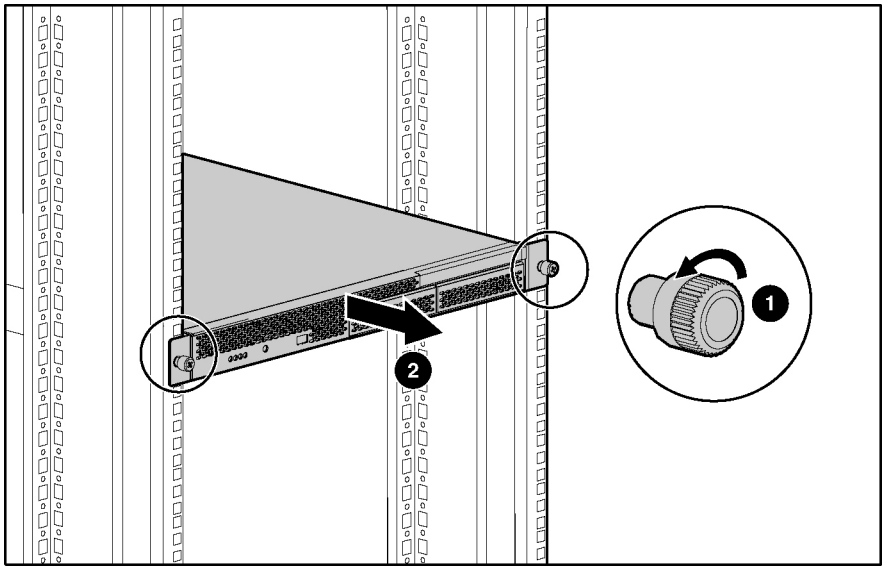

Figure 2-1: Extending the server from the rack

Reverse the steps to restore the server to operating position.

Removing the Server from the Rack

Press the side rail tabs to release the server from the rack rails.

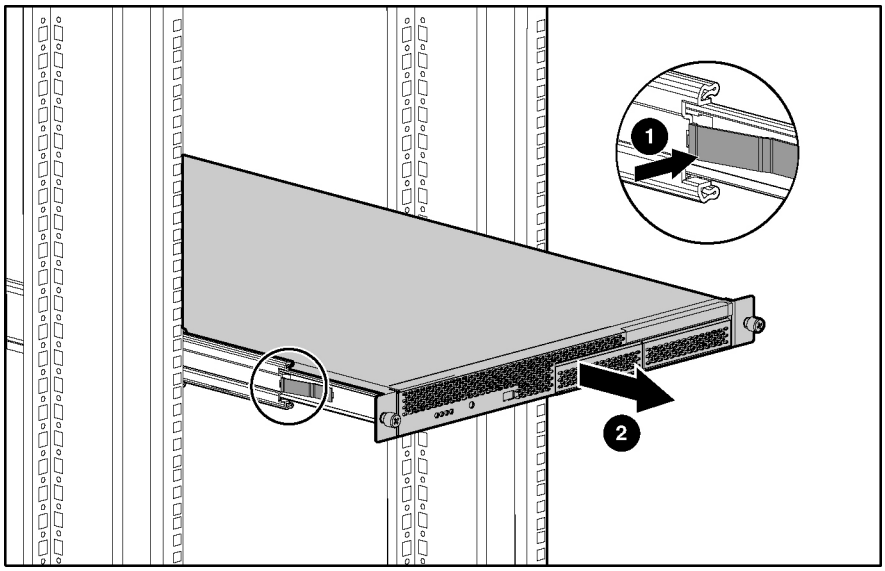

Figure 2-2: Removing the server from the rack

Removing the Access Panel

WARNING: Pressing the Power button does not remove power from all areas of the server. Portions of the power supply and some internal circuitry remain active until the AC power cord is removed.

WARNING: To reduce the risk of personal injury from hot surfaces, allow the internal system components to cool before touching.

CAUTION: Electrostatic discharge can damage electronic components. Properly ground yourself before beginning any installation procedure.

1. Power down the server. Refer to the "Powering Down the Server" section earlier in this chapter.
2. Extend the server from the rack. Refer to the "Extending the Server from the Rack" section earlier in this chapter.
3. Remove the access panel.

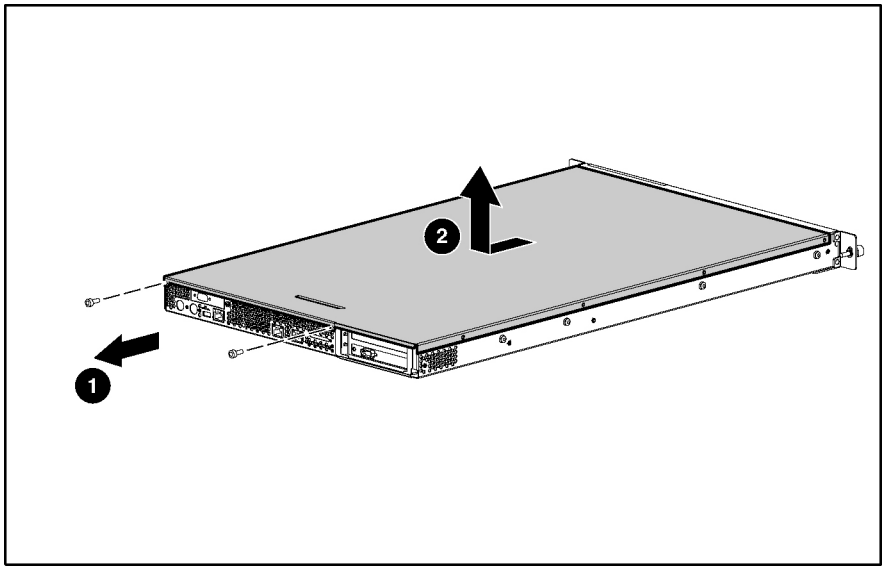

Figure 2-3: Removing the access panel

Reverse the steps to install the access panel.

Memory Options

The server provides double data rate (DDR) synchronous dynamic RAM (SDRAM) that can improve memory clock speed to at least 333-MHz. It activates output on both the rising and falling edge of the system clock rather than on just the rising edge, potentially doubling output. The server features the following advanced memory technologies:

- Support for up to 16 GB of industry-standard PC2700 registered ECC DDR SDRAM memory
- Dual-Channel Memory Architecture

Memory Guidelines

- Bank 1A must always be populated.
- DIMMs must be installed in pairs and starting at the bank closest to the processor.
- All DIMMs in a bank must have the same part number.
- DIMMs on different banks can be of different sizes.
- Processor 2 must be installed before banks 2A and 2B are populated.
- If processor 2 is installed, it is recommended that bank 2A be populated before populating bank 1B.

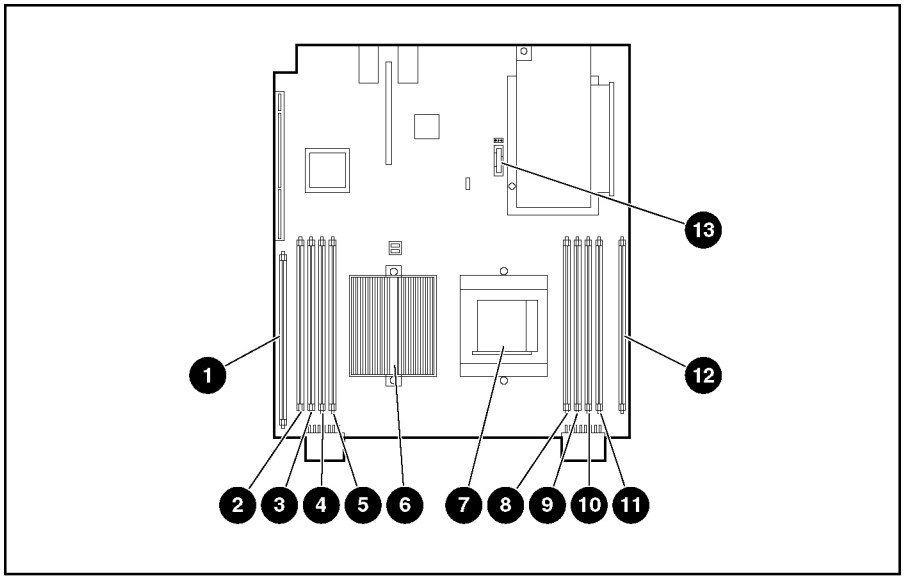

Figure 2-4: Processor, PPM, DIMM, and system battery locations

Table 2-1: DIMM and Processor Locations

Item	Description	Bank
1	Processor Power Module 1	

continued

Table 2-1: DIMM and Processor Locations *continued*

Item	Description	Bank
2	DIMM slot 4	Bank 1B
3	DIMM slot 3	Bank 1B
4	DIMM slot 2	Bank 1A
5	DIMM slot 1	Bank 1A
6	Processor socket 1	
7	Processor socket 2	
8	DIMM slot 1	Bank 2A
9	DIMM slot 2	Bank 2A
10	DIMM slot 3	Bank 2B
11	DIMM slot 4	Bank 2B
12	Processor Power Module 2	
13	System battery	

To remove a DIMM:

1. Power down the server. Refer to "Powering Down the Server" earlier in this chapter.
2. Extend the server from the rack. Refer to "Extending the Server from the Rack" earlier in this chapter.
3. Remove the access panel. Refer to "Removing the Access Panel" earlier in this chapter.
4. Remove the DIMM.

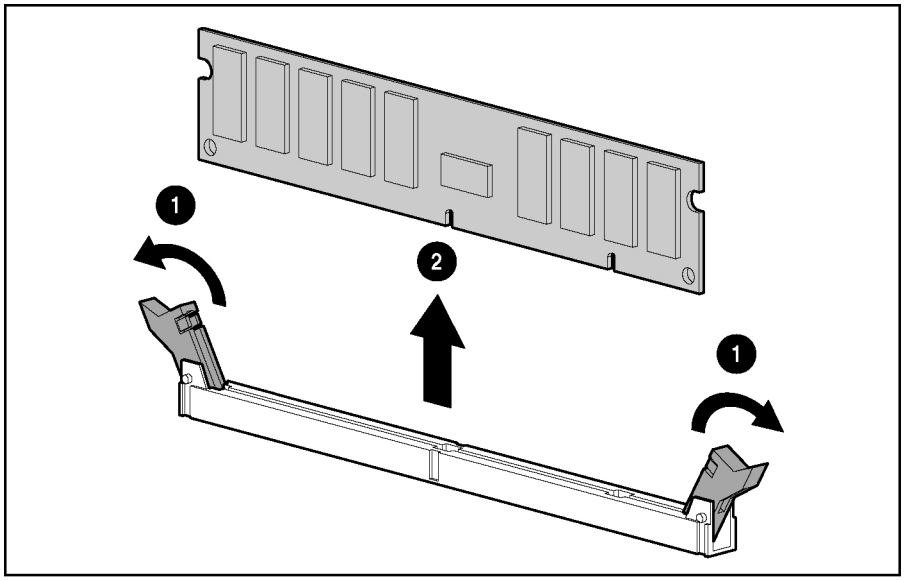

Figure 2-5: Removing a DIMM

Reverse steps to replace a DIMM.

Processors

The server supports up to two processors.

CAUTION: Processor socket 1 and processor power module (PPM) slot 1 must be populated at all times or the server will not function properly.

CAUTION: If upgrading processor speed, update the system ROM before installing the processor.

IMPORTANT: Mixing processor speeds and cache sizes is not supported.

To remove a processor:

1. Power down the server. Refer to "Powering Down the Server" earlier in this chapter.
2. Extend the server from the rack. Refer to "Extending the Server from the Rack" earlier in this chapter.
3. Remove the access panel. Refer to "Removing the Access Panel" earlier in this chapter.
4. Remove the heatsink.

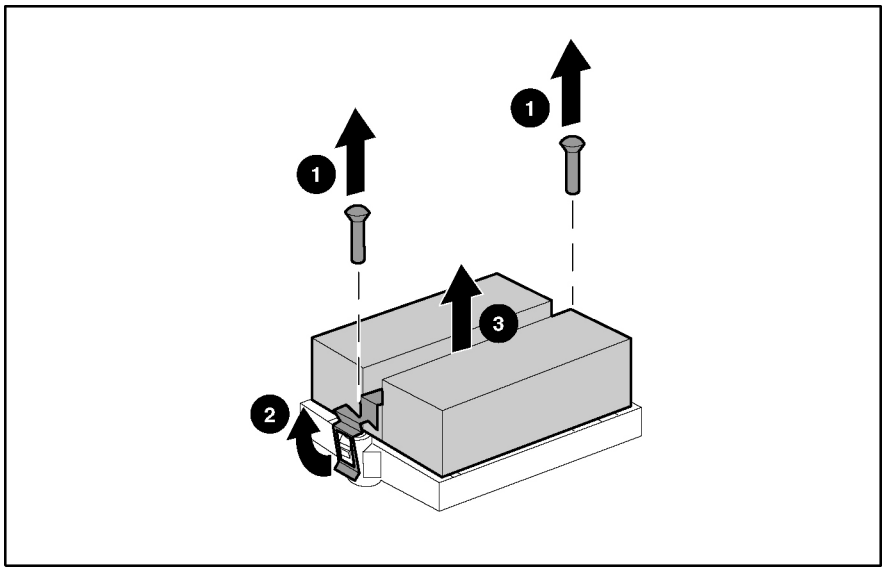

Figure 2-6: Removing a heatsink

5. Remove the processor.

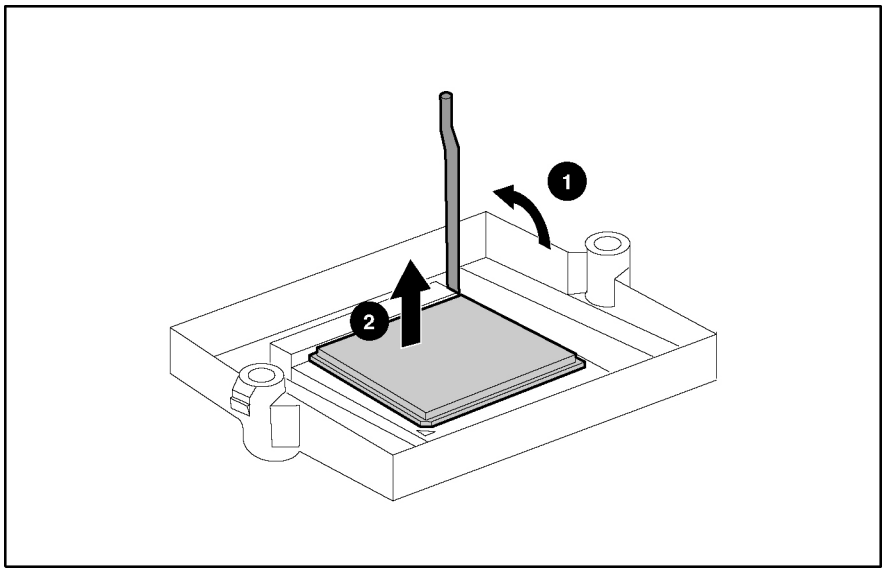

Figure 2-7: Removing a processor

Reverse the steps to replace a processor.

Processor Power Module (PPM)

To remove a PPM:

1. Power down the server. Refer to "Powering Down the Server" earlier in this chapter.
2. Extend the server from the rack. Refer to "Extending the Server from the Rack" earlier in this chapter.
3. Remove the access panel. Refer to "Removing the Access Panel" earlier in this chapter.
4. Remove the PPM.

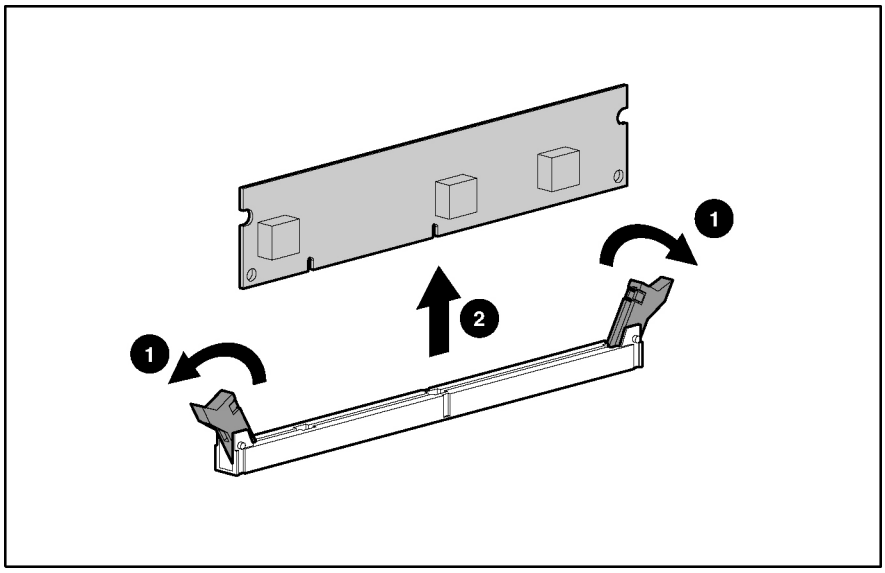

Figure 2-8: Removing a PPM

Reverse the steps to replace a PPM.

DVD Drive

To remove the DVD drive and the DVD adapter board:

1. Power down the server. Refer to "Powering Down the Server" earlier in this chapter.
2. Extend the server from the rack. Refer to "Extending the Server from the Rack" earlier in this chapter.
3. Remove the access panel. Refer to "Removing the Access Panel" earlier in this chapter.
4. Remove the retainer clip.

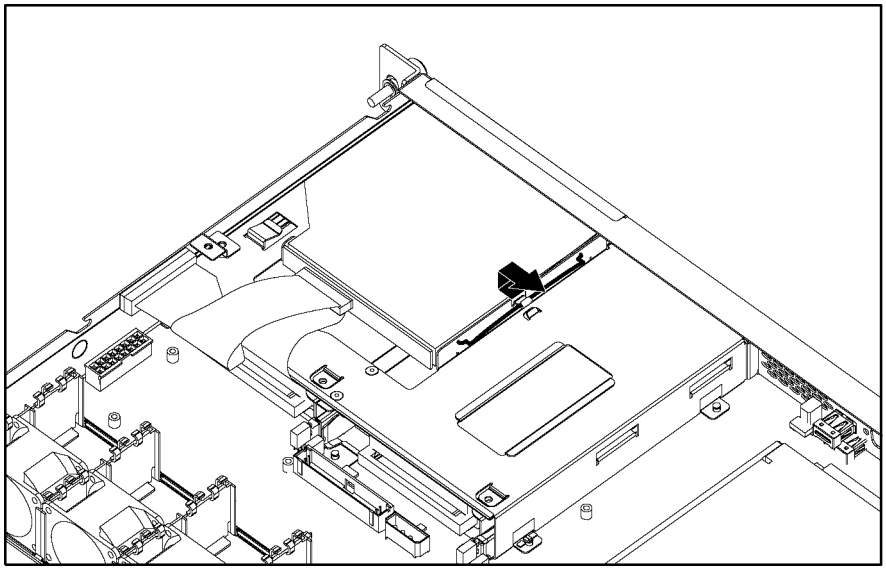

Figure 2-9: Removing retainer clip from the DVD drive

5. Disconnect the cables and remove the DVD drive.

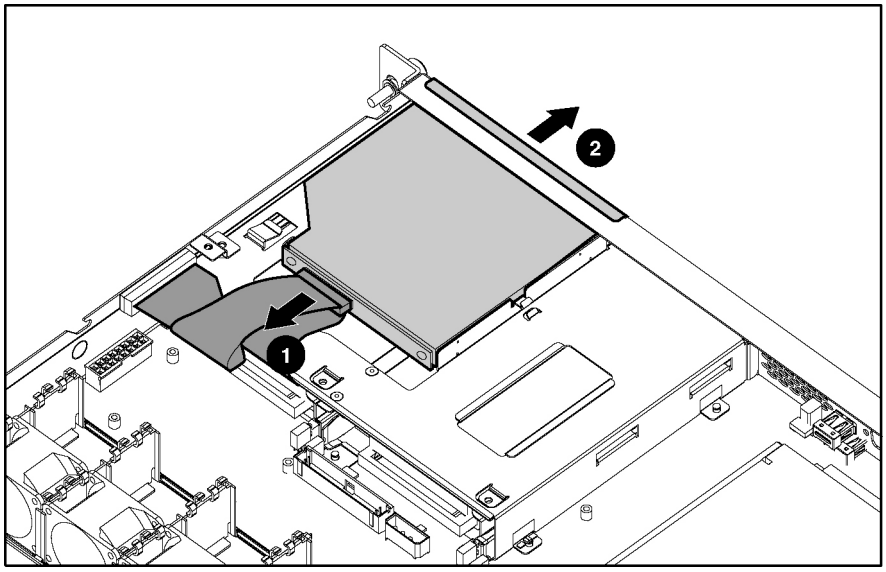

Figure 2-10: Removing a DVD drive

6. Remove the DVD adapter board from the DVD drive.

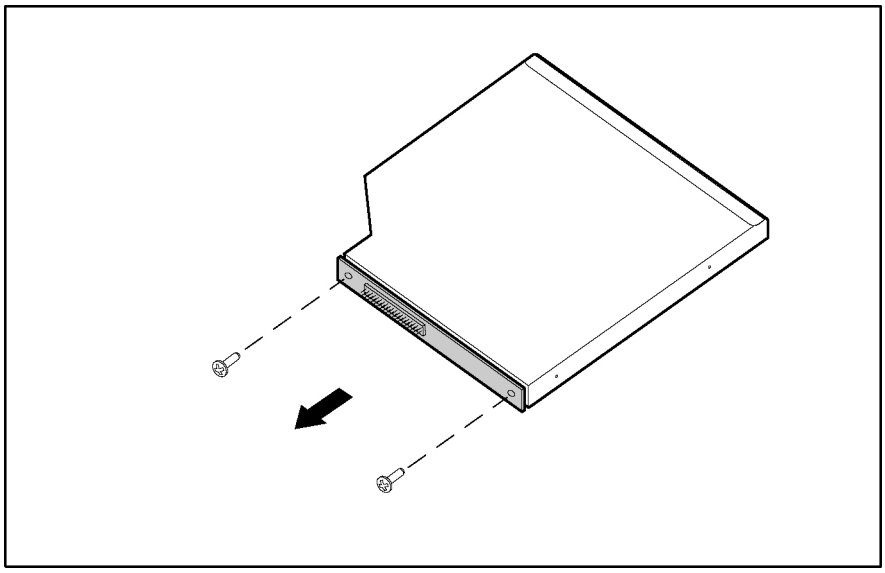

Figure 2-11: Removing the DVD adapter board from the DVD drive

Reverse the steps to replace the DVD drive and the DVD adapter board.

Hard Drives

Removing the Drive in Drive Bay 1

To remove a hard drive from bay 1:

1. Power down the server. Refer to "Powering Down the Server" earlier in this chapter.
2. Extend the server from the rack. Refer to "Extending the Server from the Rack" earlier in this chapter.
3. Remove the access panel. Refer to "Removing the Access Panel" earlier in this chapter.
4. Remove the drive tray screw.
5. Disconnect the drive cables from the server.
6. Remove the drive tray from bay 1.

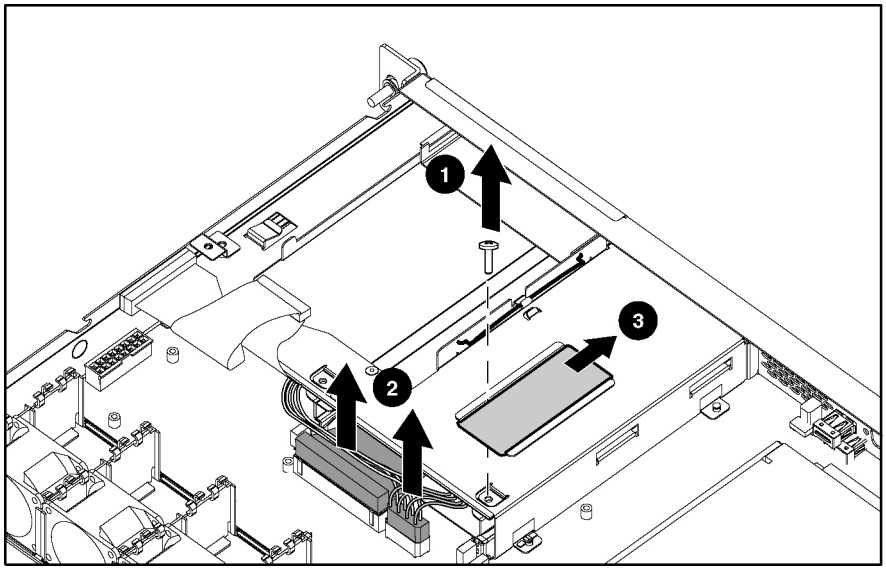

Figure 2-12: Removing the drive tray

7. Disconnect the cables from the drive.

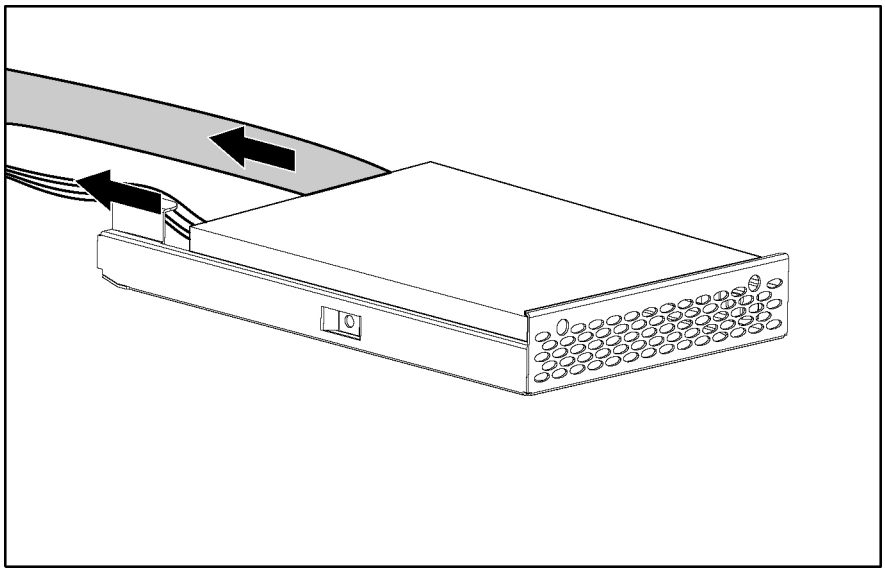

Figure 2-13: Disconnecting the cables from the drive

8. Remove the drive from the drive tray.

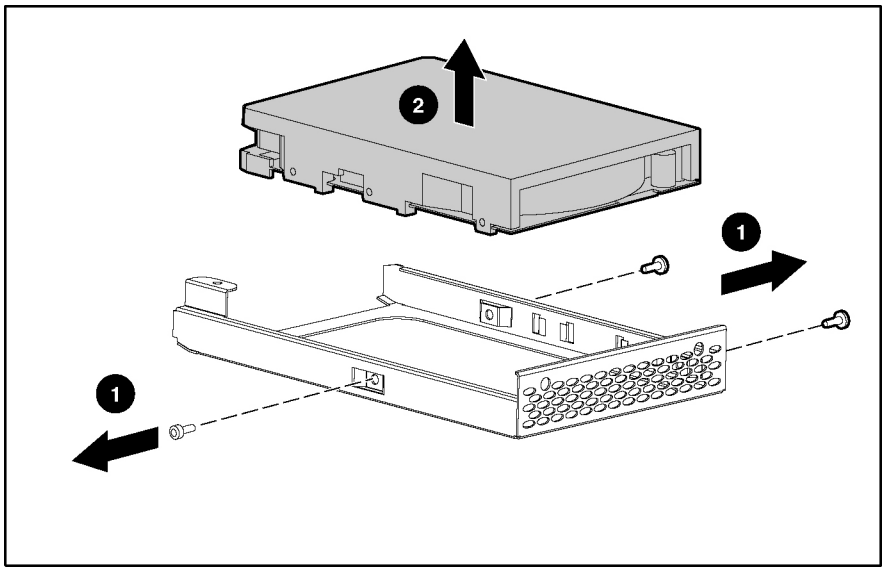

Figure 2-14: Removing the drive from the drive tray

IMPORTANT: To simplify the installation of the drive, connect the cables to the drive before installing the drive in the server.

Reverse the steps to replace a disk drive.

Removing the Drive in Drive Bay 2

To remove a hard drive from bay 2:

1. Power down the server. Refer to "Powering Down the Server" earlier in this chapter.
2. Extend the server from the rack. Refer to "Extending the Server from the Rack" earlier in this chapter.
3. Remove the access panel. Refer to "Removing the Access Panel" earlier in this chapter.
4. Remove the DVD drive or media bay blank. For more information, refer to the "DVD Drive" section earlier in this chapter.
5. Remove the drive tray screw.
6. Disconnect the cables from the drive. You may need to slide the drive tray forward to gain access to the cables.
7. Remove the drive tray from bay 2.

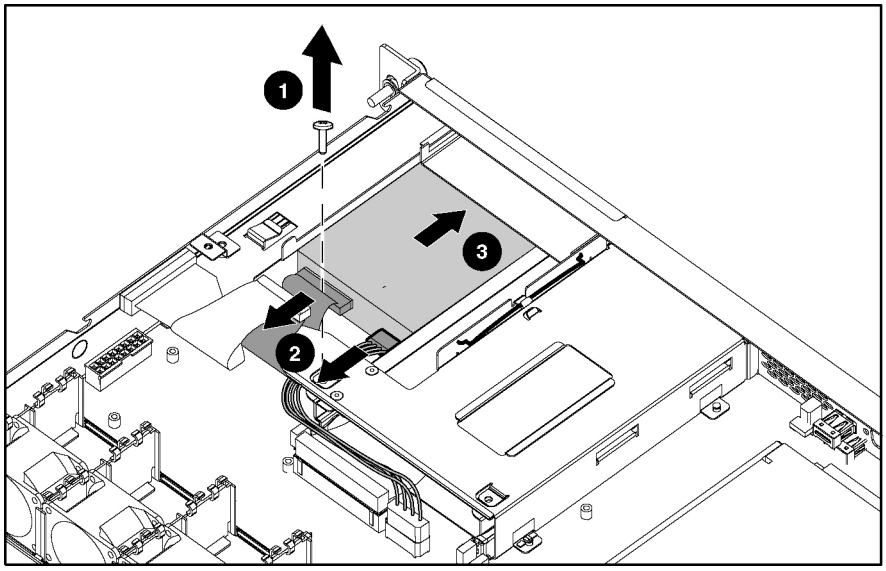

Figure 2-15: Removing the drive tray

8. Remove the drive from the drive tray.

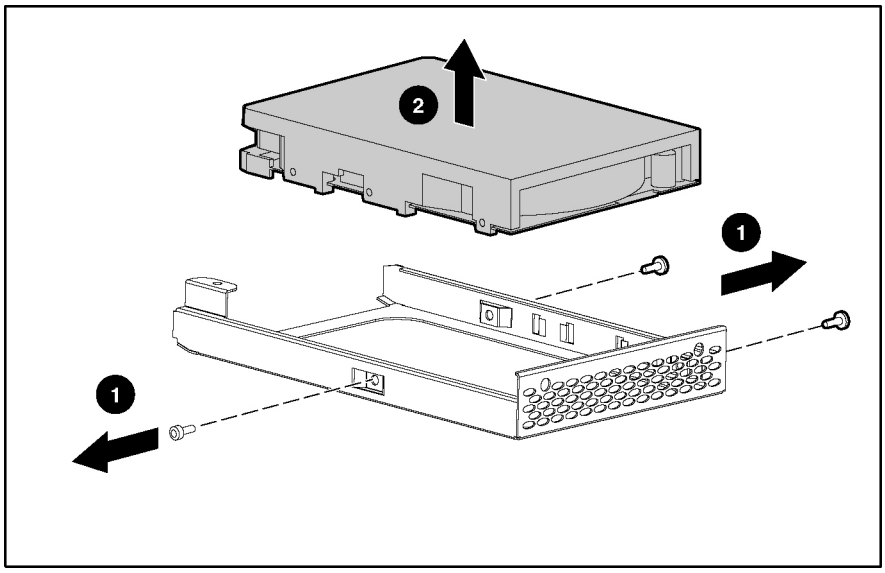

Figure 2-16: Removing the drive from the drive tray

IMPORTANT: To simplify the installation of the drive, connect the cables to the drive before installing the DVD drive and securing the drive tray to the server.

Reverse the steps to replace a disk drive.

PCI-X Riser Cage

Removing the PCI-X Riser Cage

To remove the PCI-X riser cage:

1. Power down the server. Refer to "Powering Down the Server" earlier in this chapter.
2. Extend the server from the rack. Refer to "Extending the Server from the Rack" earlier in this chapter.
3. Remove the access panel. Refer to "Removing the Access Panel" earlier in this chapter.
4. Remove the PCI-X riser cage.

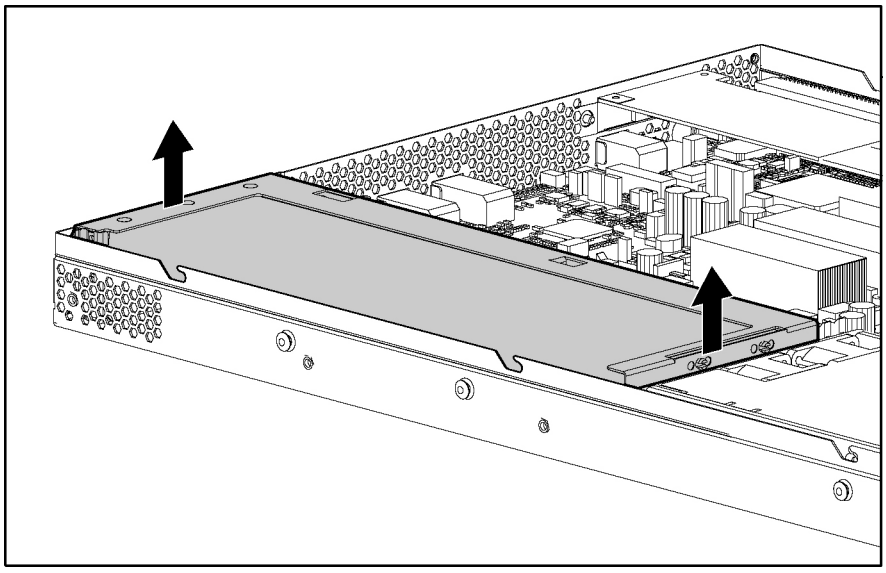

Figure 2-17: Removing the PCI-X riser cage

Reverse the steps to replace the PCI-X riser cage.

Removing the PCI-X Expansion Board

To remove a PCI-X expansion board:

1. Power down the server. Refer to "Powering Down the Server" earlier in this chapter.
2. Extend the server from the rack. Refer to "Extending the Server from the Rack" earlier in this chapter.
3. Remove the access panel. Refer to "Removing the Access Panel" earlier in this chapter.
4. Remove the PCI-X riser cage. Refer to "Removing the PCI-X Riser Cage" earlier in this chapter.
5. Disconnect any cables connected to the expansion board.
6. Remove the board from the slot.

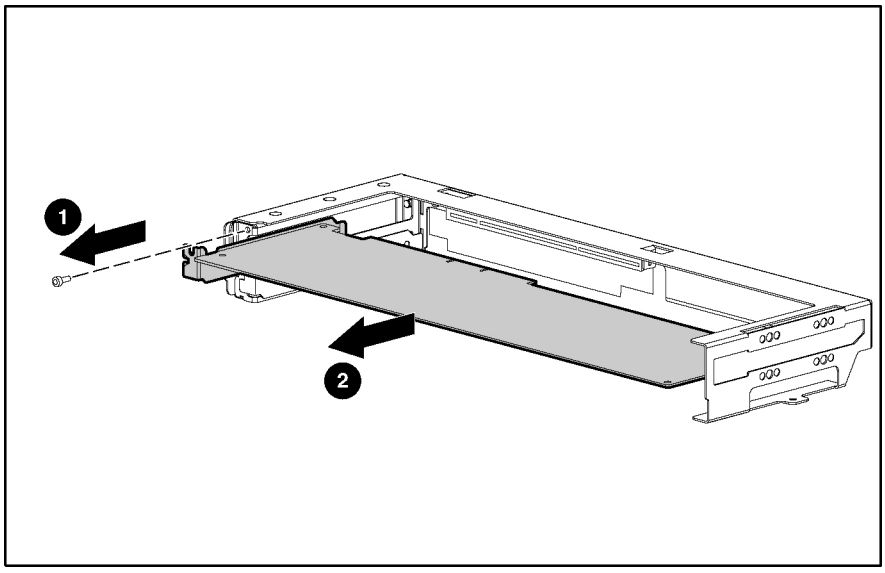

Figure 2-18: Removing the expansion board

Reverse the steps to replace the expansion board.

Removing the COM1/IPMI Connector

To remove the COM1/IPMI connector:

1. Power down the server. Refer to "Powering Down the Server" earlier in this chapter.
2. Extend the server from the rack. Refer to "Extending the Server from the Rack" earlier in this chapter.
3. Remove the access panel. Refer to "Removing the Access Panel" earlier in this chapter.
4. Remove the PCI-X riser cage. Refer to "Removing the PCI-X Riser Cage" earlier in this chapter.
5. Remove the COM1/IPMI connector from the slot.

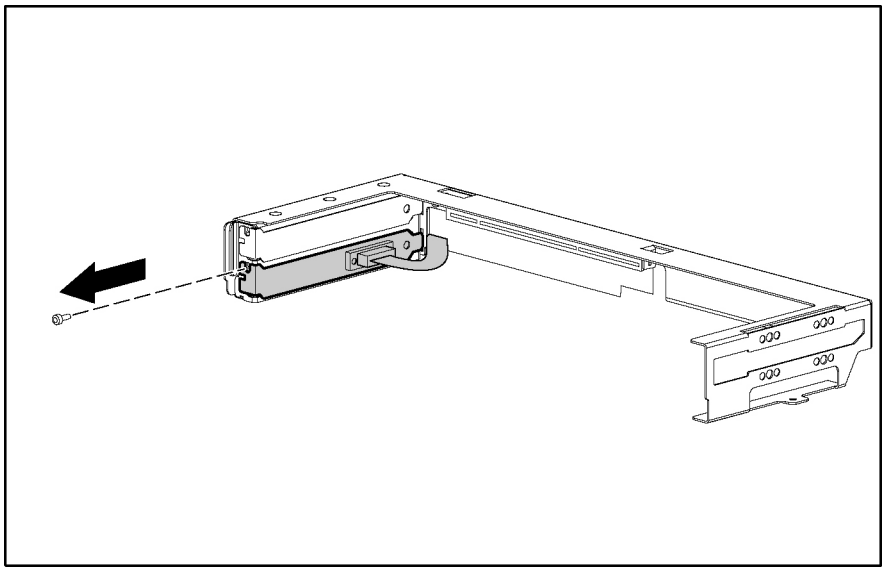

Figure 2-19: Removing the COM1/IPMI connector

6. Disconnect the other end of the COM1/IPMI connector from the server.

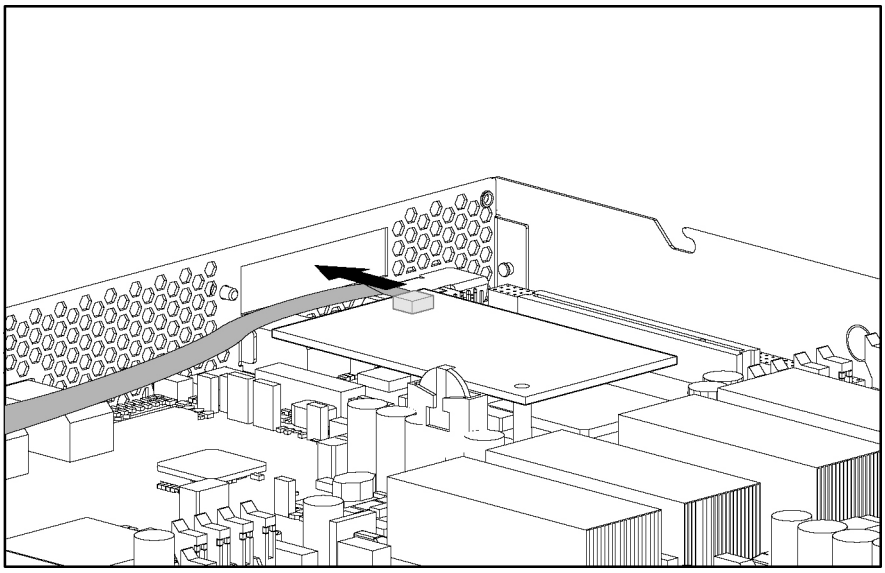

Figure 2-20: Disconnecting the COM1/IPMI connector from the server

Reverse the steps to replace the COM1/IPMI connector.

Removing the PCI-X Riser Board

To remove the PCI-X riser board:

1. Power down the server. Refer to "Powering Down the Server" earlier in this chapter.
2. Extend the server from the rack. Refer to "Extending the Server from the Rack" earlier in this chapter.
3. Remove the access panel. Refer to "Removing the Access Panel" earlier in this chapter.
4. Remove the PCI-X riser cage. Refer to "Removing the PCI-X Riser Cage" earlier in this chapter.
5. Disconnect any cables connected to the expansion board.
6. Remove the expansion board from the slot. Refer to "Removing the PCI-X Expansion Board" earlier in this chapter.
7. Remove the COM1/IPMI connector from the slot. Refer to "Removing the COM1/IPMI Connector" earlier in this chapter.
8. Remove the PCI-X riser board from the riser cage.

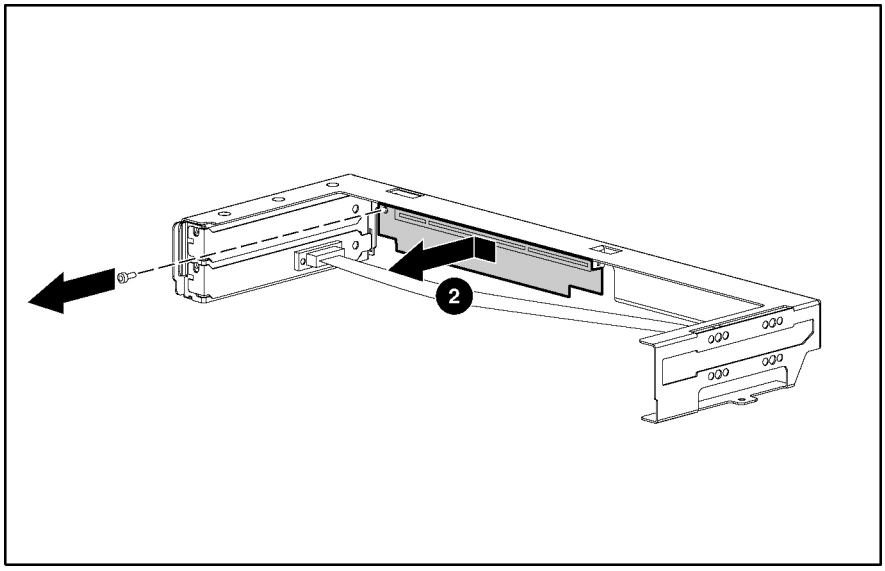

Figure 2-21: Removing the PCI-X riser board from the riser cage

Reverse the steps to replace the PCI-X riser board.

Power Supply

To remove a power supply:

1. Power down the server. Refer to "Powering Down the Server" earlier in this chapter.
2. Extend the server from the rack. Refer to "Extending the Server from the Rack" earlier in this chapter.
3. Remove the access panel. Refer to "Removing the Access Panel" earlier in this chapter.
4. Remove the PCI-X riser cage. Refer to "Removing the PCI-X Riser Cage" earlier in this chapter.
5. Disconnect the power cord from the power supply.
6. Remove the power supply.

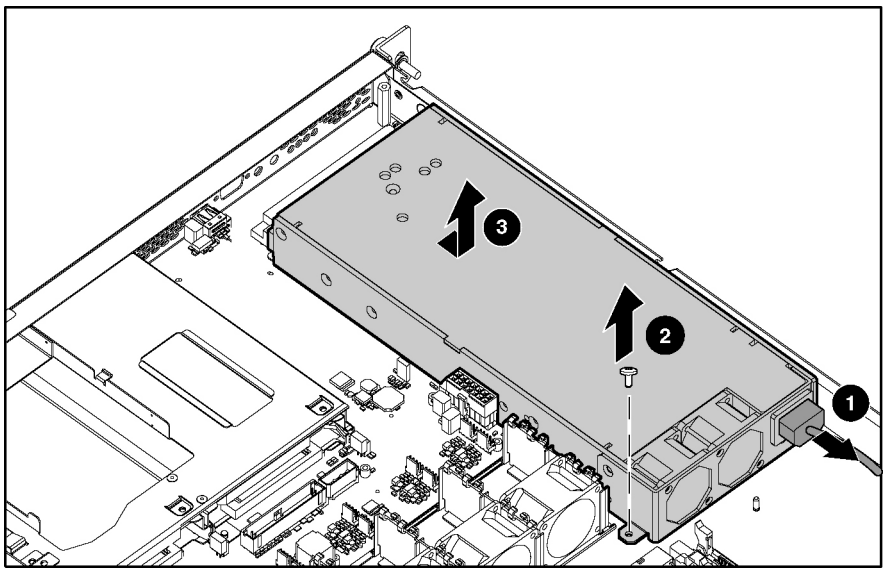

Figure 2-22: Removing the power supply

Reverse the steps to replace the power supply.

Fans

To replace the fans

1. Power down the server. Refer to "Powering Down the Server" earlier in this chapter.
2. Extend the server from the rack. Refer to "Extending the Server from the Rack" earlier in this chapter.
3. Remove the access panel. Refer to "Removing the Access Panel" earlier in this chapter.
4. Disconnect the fans.

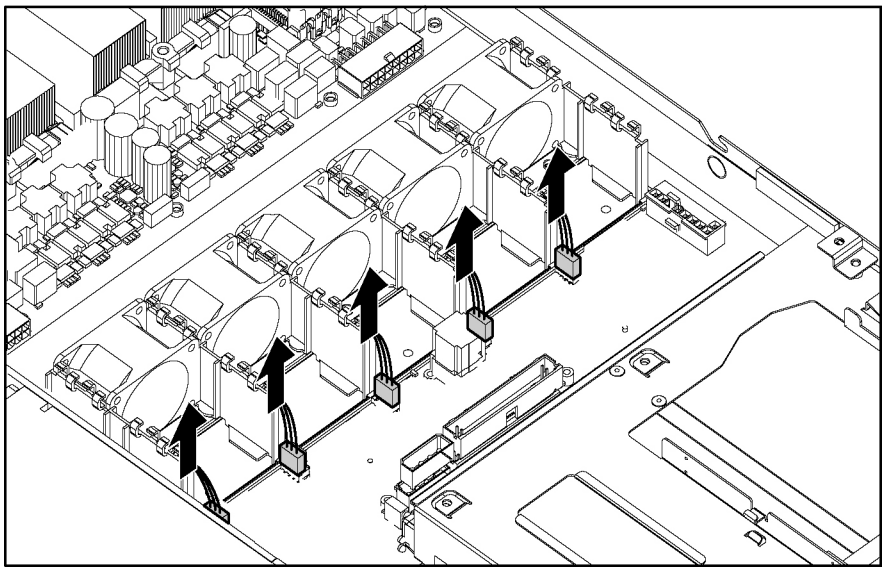

Figure 2-23: Disconnecting the fans

5. Remove the fans.

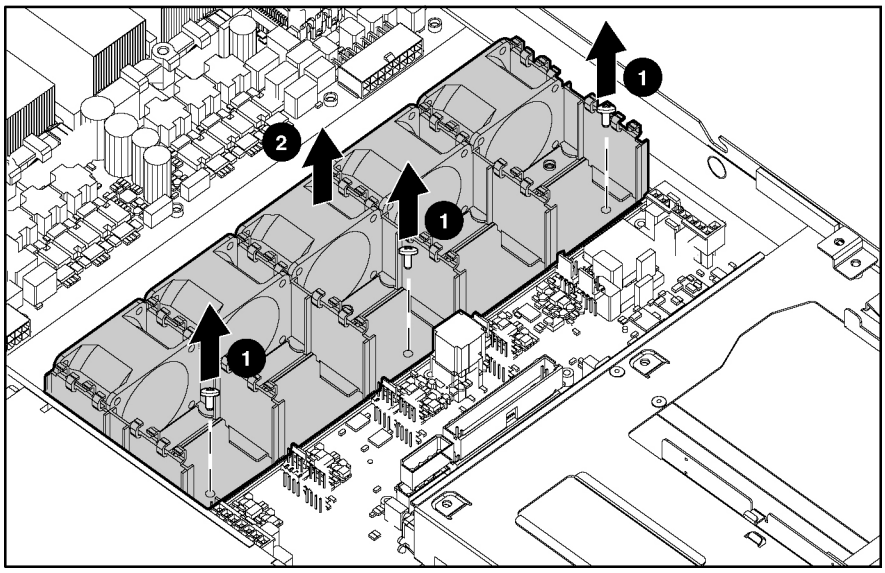

Figure 2-24: Removing the fans

Reverse the steps to replace the fans.

Video Board

To remove the video board:

1. Power down the server. Refer to "Powering Down the Server" earlier in this chapter.
2. Extend the server from the rack. Refer to "Extending the Server from the Rack" earlier in this chapter.
3. Remove the access panel. Refer to "Removing the Access Panel" earlier in this chapter.
4. Remove the video board.

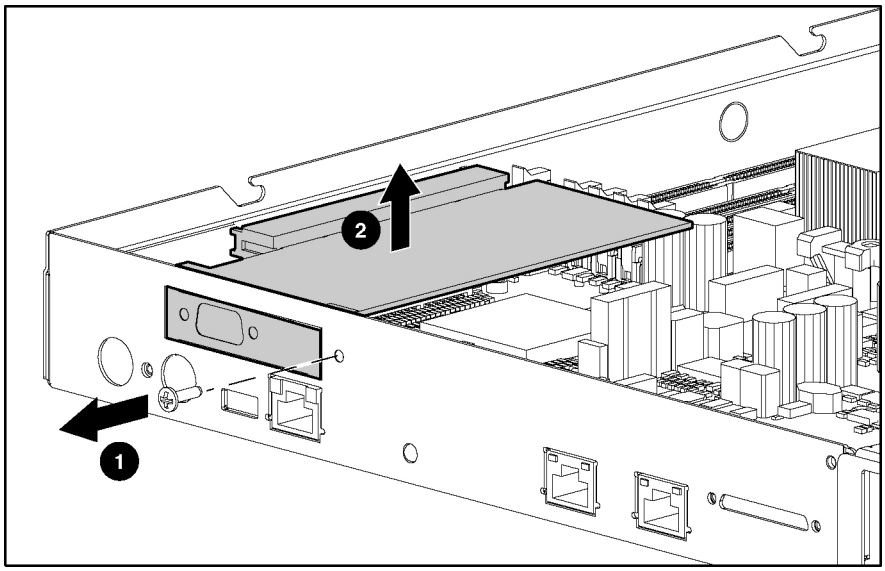

Figure 2-25: Removing the video board

Reverse the steps to replace the video board.

32-Bit PCI Riser Board

To remove the 32-bit PCI riser board:

1. Power down the server. Refer to "Powering Down the Server" earlier in this chapter.
2. Extend the server from the rack. Refer to "Extending the Server from the Rack" earlier in this chapter.
3. Remove the access panel. Refer to "Removing the Access Panel" earlier in this chapter.
4. Remove the video board. Refer to "Video Board" earlier in this chapter.
5. Remove the 32-bit PCI riser board.

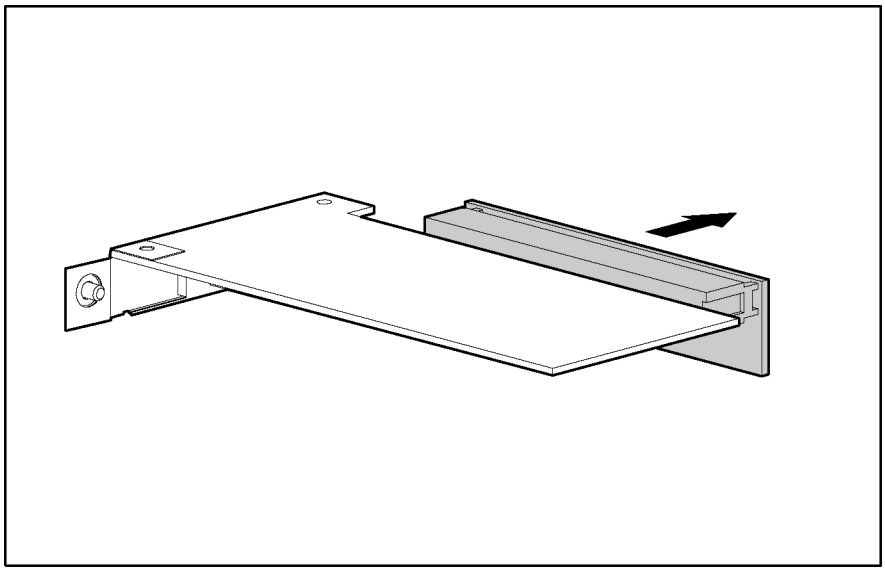

Figure 2-26: Removing the 32-bit PCI riser board

Reverse the steps to replace the 32-bit PCI riser board.

IPMI Base Management Controller

To remove the IPMI Base Management Controller:

1. Power down the server. Refer to "Powering Down the Server" earlier in this chapter.
2. Extend the server from the rack. Refer to "Extending the Server from the Rack" earlier in this chapter.
3. Remove the access panel. Refer to "Removing the Access Panel" earlier in this chapter.
4. Remove the video board. Refer to "Video Board" earlier in this chapter.
5. Remove the IPMI Base Management Controller.

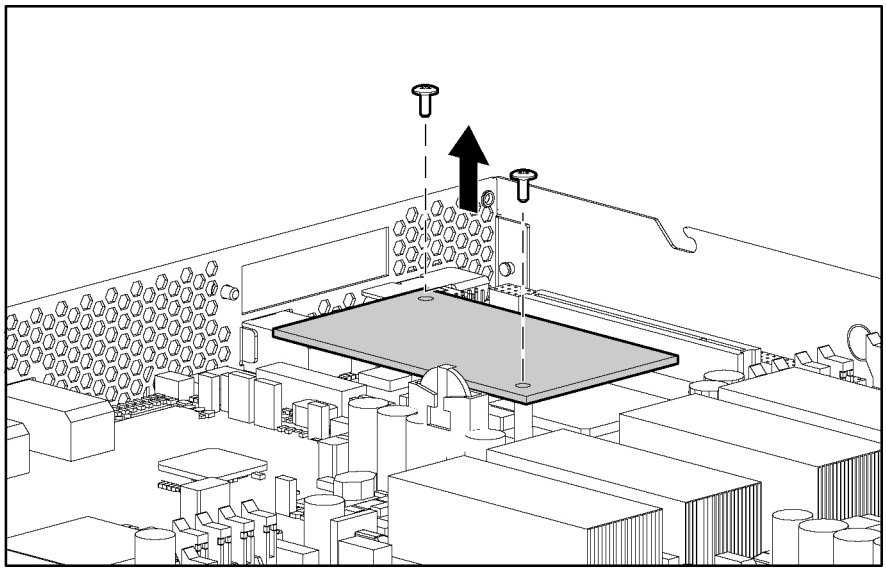

Figure 2-27: Removing the IPMI Base Management Controller

Reverse the steps to replace the IPMI Base Management Controller.

Signal Interface Board

To remove the signal interface board:

1. Power down the server. Refer to "Powering Down the Server" earlier in this chapter.
2. Extend the server from the rack. Refer to "Extending the Server from the Rack" earlier in this chapter.
3. Remove the access panel. Refer to "Removing the Access Panel" earlier in this chapter.
4. Remove the signal interface board.

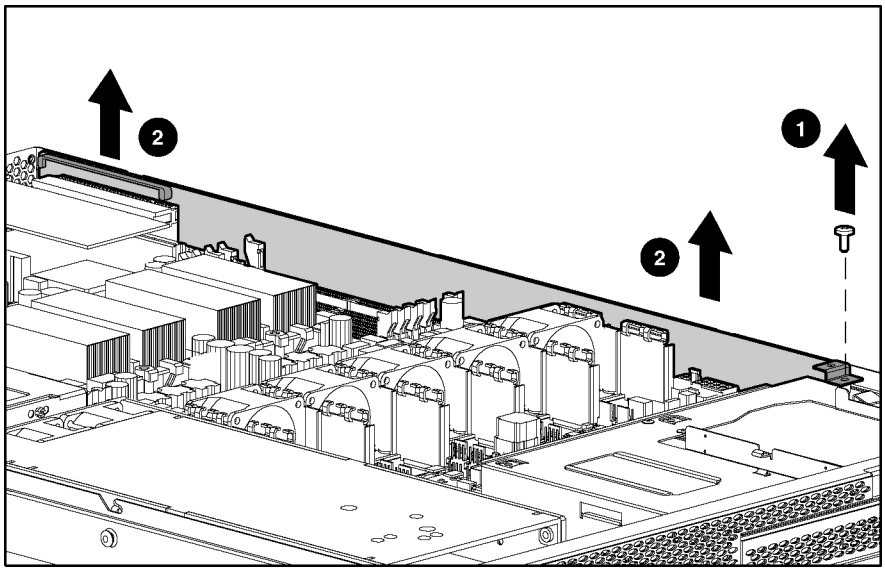

Figure 2-28: Removing the signal interface board

Reverse the steps to replace the signal interface board.

Front Panel Board

To remove the front panel board:

1. Power down the server. Refer to "Powering Down the Server" earlier in this chapter.
2. Extend the server from the rack. Refer to "Extending the Server from the Rack" earlier in this chapter.
3. Remove the access panel. Refer to "Removing the Access Panel" earlier in this chapter.
4. Disconnect all cables from the front panel board.
5. Remove the signal interface board. Refer to "Signal Interface Board" earlier in this chapter.
6. Remove the power supply. Refer to "Power Supply" earlier in this chapter.
7. Remove the front panel board.

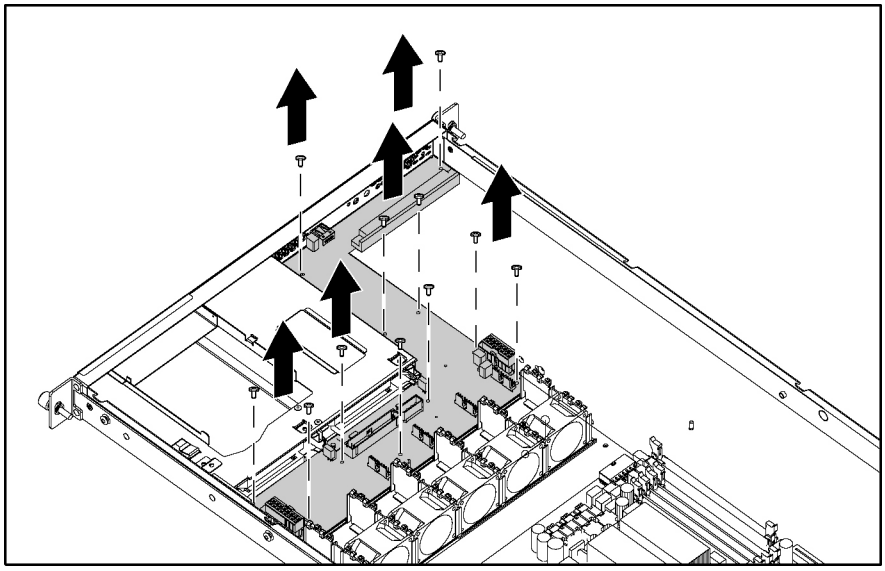

Figure 2-29: Removing the front panel board

Reverse the steps to replace the front panel board.

System Battery

WARNING: This server contains an internal lithium manganese dioxide or vanadium pentoxide battery. A risk of fire and burns exists if the battery is not handled properly. To reduce the risk of personal injury:

- **Do not attempt to recharge the battery.**
- **Do not expose to temperatures higher than 60°C (140°F).**
- **Do not disassemble, crush, puncture, short external contacts, or dispose of in fire or water.**
- **Replace only with the HP spare designated for this server.**

CAUTION: Do not dispose of batteries, battery packs, and accumulators with the general household waste. To forward them to recycling or proper disposal, use the public collection system or return them to either HP or an authorized service provider.

When the server no longer automatically displays the correct date and time, you may need to replace the battery that provides power to the real-time clock. Under normal use, battery life is usually about 5 to 10 years.

To install a new battery:

1. Power down the server. Refer to "Powering Down the Server" earlier in this chapter.
2. Extend the server from the rack. Refer to "Extending the Server from the Rack" earlier in this chapter.
3. Remove the access panel. Refer to "Removing the Access Panel" earlier in this chapter.
4. Locate the battery. To locate the battery refer to Chapter 4, "Server Component Identification."

5. Remove the existing battery.

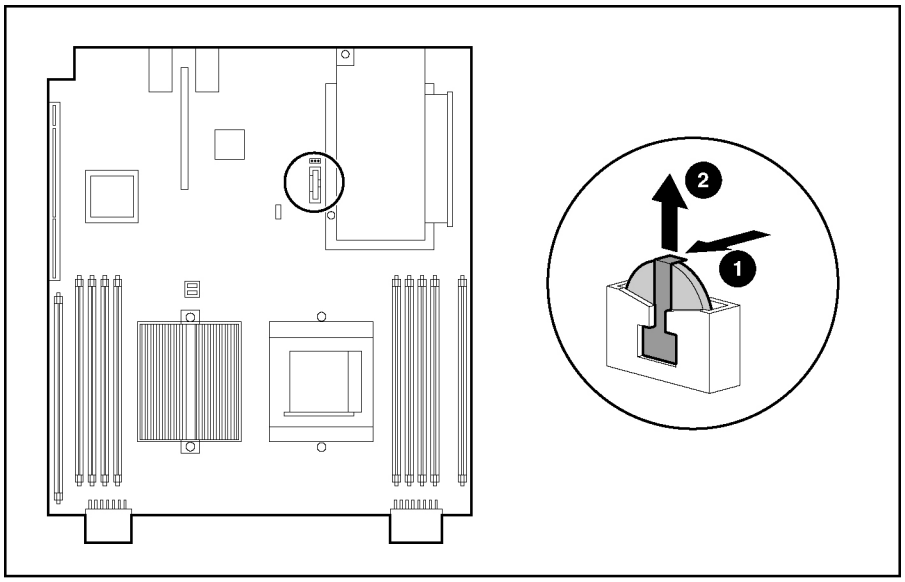

Figure 2-30: Removing a battery

6. Install the new battery.
7. Install the access panel.
8. Restore the server to its operating position in the rack.
9. Reconfigure the server using the BIOS Setup Utility if the settings were lost. Refer to *HP ProLiant DL145 Server User Guide* for more information on the BIOS Setup Utility.

System Board

To remove the system board:

1. Power down the server. Refer to "Powering Down the Server" earlier in this chapter.
2. Extend the server from the rack. Refer to "Extending the Server from the Rack" earlier in this chapter.
3. Remove the access panel. Refer to "Removing the Access Panel" earlier in this chapter.
4. Remove the PCI-X riser cage.
5. Remove the processors.
6. Remove the Processor Power Modules.
7. Remove the DIMMs.
8. Remove the video board.
9. Remove the 32-bit riser board.
10. Remove the IPMI Base Management Controller.
11. Remove the signal interface board.
12. Unscrew the system board screws.
13. Remove the system board.

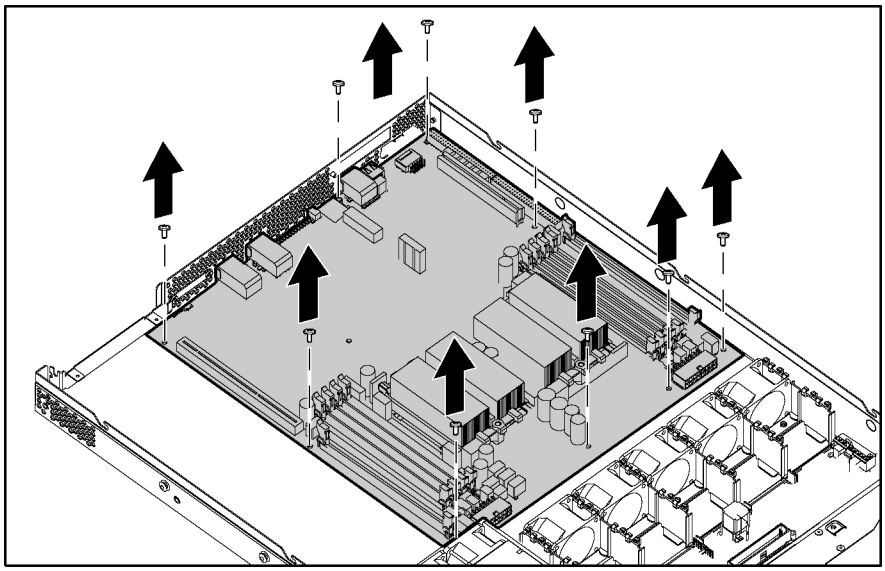

Figure 2-31: Removing the system board

Reverse the steps to replace the system board.

3

Diagnostic Tools

Table 3-1: Diagnostic Tools

Tool	Description	How to run the tool
Insight Diagnostics	Insight Diagnostics tests and verifies operation of HP hardware. If Diagnostics finds a hardware failure, it isolates the replaceable part, if possible. Insight Diagnostics also gathers critical hardware and software information on ProLiant servers.	Diagnostics can be downloaded by following the support link on the product website at www.hp.com/support.
Systems Insight Manager	When run on the ProLiant 300/500/700 series units, HP Systems Insight Manager provides a central management station to monitor the up and down status of the ProLiant 100 server series and provide system inventory and configuration information.	You can download the HP Systems Insight Manager software as well as the HP Systems Insight Manager Installation and User Guide at http://www.hp.com/go/hpsim
BIOS Setup Utility	This utility configures the hardware installed in or connected to the server. Specifically, it can: Configure system devices and installed options View system information Select the boot device and boot priority Configure ports and IRQs, if required	Run BIOS Setup by pressing the **F10** key during POST.
System Event Log (SEL)	The SEL is a part of the BIOS Setup Utility described above. The SEL is a log of system events such as system failures or nonfatal error conditions.	Run BIOS Setup by pressing the **F10** key during POST.
ROMPaq Utility	The ROMPaq Utility checks the system and provides a choice of available ROM revisions and firmware.	Download the latest ROMPaq at www.hp.com/support and follow the instructions included with it.
Watchdog Timer	The watchdog timer is a function of the Management Processor.	You can enable this timer in the BIOS Setup Management Processor Configuration menu.

4

Server Component Identification

Front Panel Components

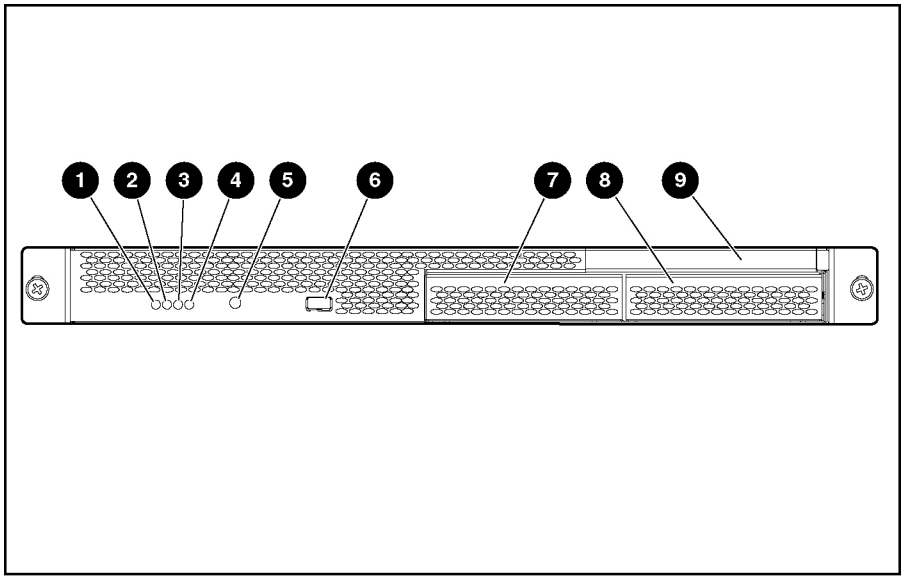

Figure 4-1: Front panel components

Table 4-1: Front Panel Components

Item	Description	Status
1	LAN activity LED	On = Network link Flashing = Network link and activity Off = No link to network
2	System health LED	Off = Normal On = System degraded
3	Disk drive activity LED	On = Drive activity Flashing = High drive activity Off = No drive activity

continued

Table 4-1: Front Panel Components *continued*

Item	Description	Status
4	Power LED	On = Power on Off = Power off
5	Power button	
6	USB port	
7	Hard drive bay 1	
8	Hard drive bay 2	
9	Media bay	

Rear Panel Connectors

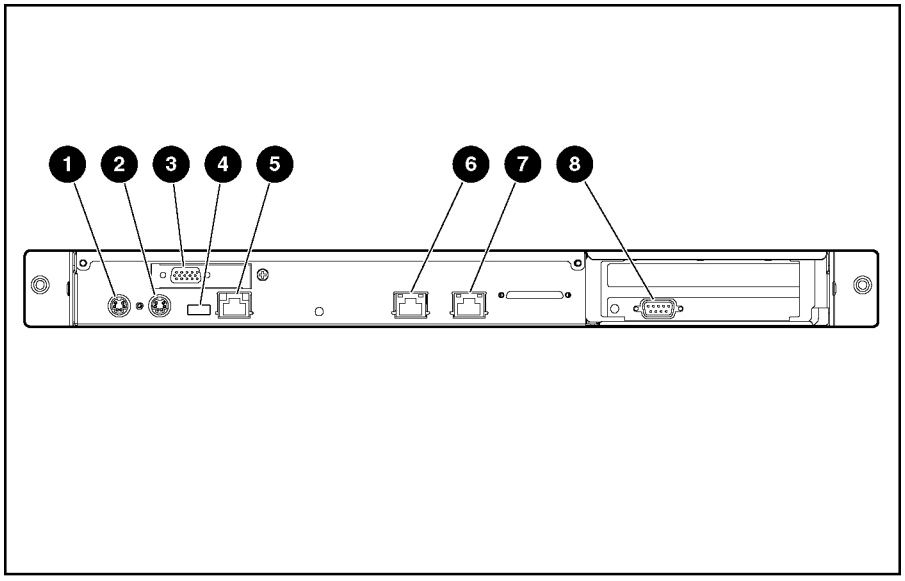

Figure 4-2: Rear panel connectors

Table 4-2: Rear Panel Connectors

Item	Description	Item	Description
1	Mouse	5	Out of Band Management NIC
2	Keyboard	6	NIC 2
3	Video	7	NIC 1
4	USB	8	COM1/IPMI

Rear Panel LEDs

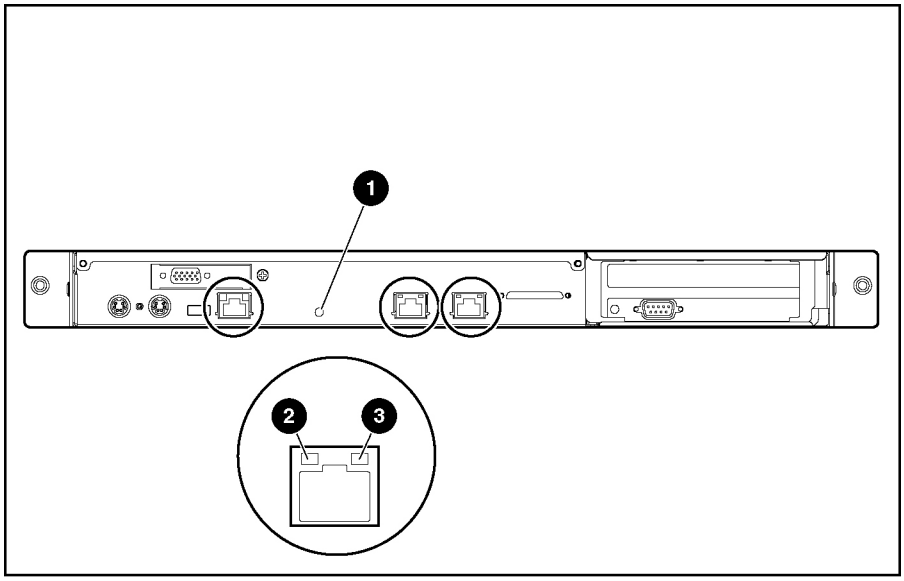

Figure 4-3: Rear Panel LEDs

Table 4-3: Rear Panel LEDs

Item	Description	LED Color	Status
1	Aux Power LED	Amber	On = Aux power present
			Off = No Aux power
2	LAN Link LED	Green	Green = 1 GB connection
			Off = no link to network
		Red	Red = 10/100 MB connection
			Off = no link to network
3	LAN Activity LED	Amber	On or flashing = network activity
			Off = no network activity

System Board Components

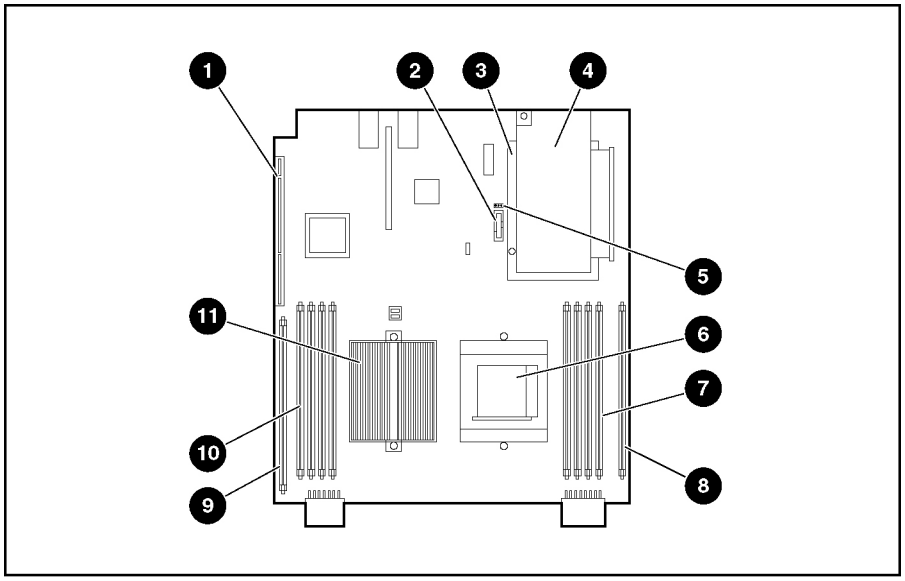

Figure 4-4: System board components

Table 4-4: System Board Components

Item	Description
1	PCI-X riser board slot
2	NVRAM Battery
3	IPMI Base Management Controller
4	Video board
5	J9 CMOS jumper
6	Processor socket 2
7	Memory banks 2A and 2B
8	Processor power module slot 2
9	Processor power module slot 1
10	Memory banks 1A and 1B
11	Processor 1 (boot processor)

J9 CMOS Jumper

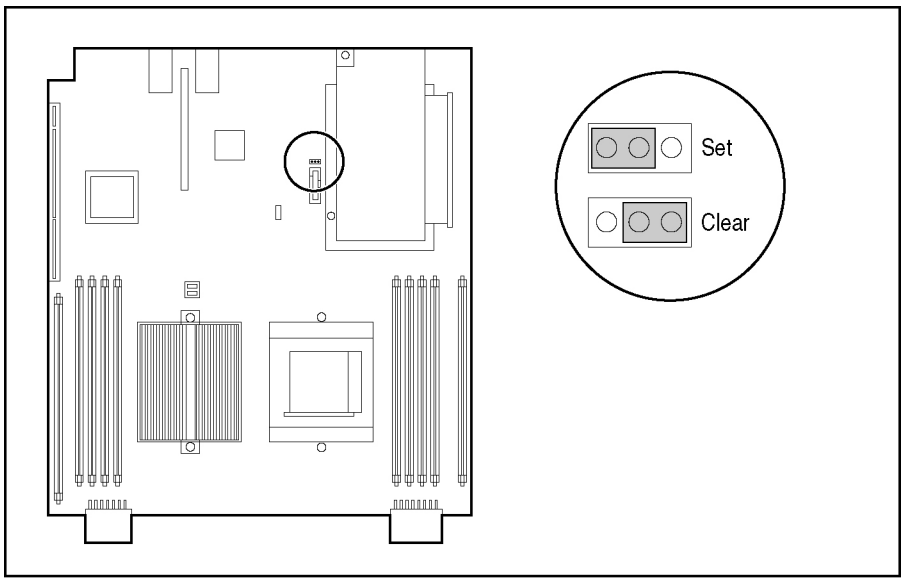

Figure 4-5: J9 CMOS Jumper

To clear CMOS:

1. Back up the server data.
2. Shut down the operating system as directed by the operating system documentation.
3. Press the Power button to power down the server. When the server powers down, the system power LED turns off.
4. Disconnect the power cord.
5. Set the J9 CMOS jumper to **Clear** and hold in position for 3 seconds.
6. Reset the J9 CMOS jumper to **Set**.
7. Connect the power cord.
8. Power up the system.
9. Reconfigure the server using the BIOS Setup Utility. Refer to HP ProLiant DL145 Server User Guide for more information on the BIOS Setup Utility.

5

Troubleshooting

This chapter provides specific troubleshooting information for the server. Use it to diagnose server startup and installation problems.

For information on LEDs, switch settings, and jumpers, refer to Chapter 4, 'Server Component Identification."

If the Server Does Not Start

This section provides step-by-step instructions when encountering the most common problems during the initial Power-On Self-Test (POST). Every time the server boots, it must complete POST before it can load the operating system and start running software applications.

If the server completes POST and attempts to load the operating system, go to 'Problems After Initial Startup"in this chapter.

WARNING: There is a risk of personal injury from hazardous energy levels. The installation of options and the routine maintenance and service of this product must be performed by individuals who are knowledgeable about the procedures, precautions, and hazards associated with equipment containing hazardous energy circuits.

If the server does not start:

1. Be sure that the server and monitor are plugged into a working outlet.
2. Be sure that the power source is working properly:
   - — Confirm status using the power LED. Refer to Chapter 4, 'Server Component Identification"for the location and status of the power LED.
   - — Confirm that the power button was pressed firmly.
3. Restart the server.

4. Be sure that a normal power up sequence has occurred to confirm that the system meets the minimal hardware requirements and is powered up under normal operation. The system has powered up successfully if:
   a. The front panel power LED turns on.
   b. The fans start up.
   c. The monitor displays messages regarding server initialization.
   d. The operating system loads to complete the boot process.

If the problem persists, continue with the section, "Diagnosis Steps," in this chap ter.

Diagnosis Steps

If the server does not power up, or powers up but does not complete POST, answer the questions in Table 5-1 to determine appropriate actions based on the symptoms observed. According to the answers provided, another table in this chapter will be referenced, which will outline possible reasons for the problem, options available to assist in diagnosis, possible solutions, and list references to other sources of information.

Table 5-1: Diagnosis Steps

Question	The Next Step
Question 1: Is the front panel power LED on?	If no, go to Table 5-2.
Question 2: Is the front panel system health LED on?	If no, go to Table 5-2.
Question 3: Is anything visible on the monitor?	If no, go to Table 5-3. If yes, video is available for diagnosis. Determine the next action by observing POST progress and error messages.
NOTE: If the server attempts to load the operating system, go to "Problems After Initial Startup" in this chapter.	

WARNING: To reduce the risk of electric shock or damage to the equipment, before opening access panels to reseat components, power down the server, and then disconnect the power cord.

NOTE: For LED locations and functions, refer to Chapter 4, "Server Component Identification."

Table 5-2: Front Panel Power LED Is Not On

Possible Reasons	The Next Step
There is no AC power connection. The power button was not firmly pressed. A processor has failed or is not properly seated. The power supply has failed or is not connected.	1. Be sure the power cables are fully connected. 2. Press the power button. 3. Be sure the power source is functioning. 4. Power down the server. Reseat all expansion boards, DIMMs, processors, and PPMs. Reseat all cable connections. 5. Monitor the diagnostic LEDs on the system board for failure conditions. 6. If these steps do not correct the problem, the most likely cause lies either in the power supply subsystem or a processor. Contact an authorized service provider for further technical support.

WARNING: To reduce the risk of electric shock or damage to the equipment, before opening access panels to reseat components, power down the server, and then disconnect the power cord.

Table 5-3: Server Does Not Have Video

Possible Reasons	The Next Step
Video cable may not be properly connected. Switches may not be correctly set on the system board. If an optional video board was installed, the monitor cable may not be correctly connected. The monitor may be connected to the wrong video connector. Expansion boards or DIMMs may not be properly connected or seated.	1. Be sure that the monitor has power and that the monitor cable is securely connected. If more than one video adapter is installed, make sure that the monitor is connected to the correct video board. 2. Be sure that the monitor is functional by connecting it to a known working server. 3. Be sure that the switch settings on the system board are correctly set. 4. Power down the server. Reseat all expansion boards, DIMMs, processors, and PPMs. Reseat all cable connections. 5. Restart the server. 6. Listen for audible indicators, such as a series of beeps. A series of beeps indicates the presence of a POST error message. 7. Monitor the diagnostic LEDs on the system board for failure conditions. 8. If these steps do not correct the problem, contact an authorized service provider for further technical support.

Table 5-4: BIOS Beep Codes

Number of Beeps	Troubleshooting Action
1, 2 or 3	Reseat the memory, or replace with known good modules.
4-7, 9-11	Fatal error indicating a serious problem with the system. Remove add-in card to eliminate the possibility of interference. If the beep codes are generated even when all other expansion cards are absent, the motherboard has a serious problem. If the beep codes are not generated when all other expansion cards are absent, one of the add-in cards is causing the malfunction. Insert the cards back into the system one at a time until the problem happens again. This will reveal the malfunctioning add-in card.
8	If the system video adapter is an add-in card, replace or reseat the video adapter. If the video adapter is an integrated part of the system board, the board may be faulty.

Problems After Initial Startup

After the server has passed POST, errors may still be encountered, such as an inability to load the operating system. Use Table 5-5 to troubleshoot server installation problems that occur after the initial startup.

For updated information on supported operating systems go to

http://hp.com/go/supportos

NOTE: If the server is rebooting repeatedly, be sure that the system is not restarting due to a Watchdog Timer power up caused by another problem. Watchdog is similar to ASR on ProLiant servers 300, 500, and 700 series.

Table 5-5: Server Cannot Load Operating System

Problem	Possible Cause	Possible Solution
Server cannot load operating system.	Required operating system step was missed.	Follow these steps: 1. Note at which phase the operating system failed. 2. Remove any loaded operating system components. 3. Refer to the operating system documentation. 4. Reinitiate installation procedures.
	Primary hard drive controller installation is incorrect.	Run BIOS Setup by pressing the **F10** key and correct this problem.
	Hard drives and other devices may not be set to proper boot order in Boot Device Priority settings in BIOS Setup.	Run BIOS Setup by pressing the **F10** key and correct this problem.
	New hardware was added to the system.	Refer to the documentation provided with the hardware. Remove the new hardware.
	Hardware was added to a system with a factory-installed operating system.	The factory-installed operating system software installation must be completed **before** adding new hardware to the system. Be sure that all instructions provided in the *HP Factory-Installed Operating System Software Installation Guide* are being followed. Remove the new hardware and complete the software installation. Then, reinstall the new hardware.

Other Resources

Information on warranties and service and support upgrades (HP Services Care Pack) can be found by visiting

www.hp.com

6

Specifications

This chapter provides operating and performance specifications for the server.

Table 6-1: Server Specifications

Feature	Units
Dimensions	
Height	4.3 cm (1.7 in)
Depth	71.1 cm (28 in)
Width	43.1 cm (17.0 in)
Weight	13.6 kg (30 lb)
International input requirements	
Rated input voltage	180 V to 264 V
Rated input frequency	47 Hz to 63 Hz
Rated input current	1 AMP @240 VAC
U.S. input requirements	
Rated input voltage	90 V to 132 V
Rate input frequency	47 Hz to 63 Hz
Rated input current	2.5 A @100VAC
Power supply output power	
Rated steady-state power	500 W
Maximum peak power	500 W
Temperature range	
Operating	10° to 35°C (50° to 95°F)
Non-operating	-30° to 60°C (-4° to 140°F)
Relative humidity (non-condensing)	
Operating	20% to 80%
Non-operating	5% to 90%
Maximum wet bulb temperature	38.7°C (101.7°F)

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